



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

THIRD YEAR SECOND SEMESTER EXAMINATION FOR DIPLOMA IN
ELECTRICAL AND ELECTRONICS ENGINEERING

EED 311: MACHINES AND UTILIZATION II

DATE: 30/5/2017

TIME: 8:30 – 10:30 AM

INSTRUCTIONS

Answer Question One and Any Other Two Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- (a) Define Refrigeration and explain the principle of refrigeration. (5 marks)
- (b) Name types of special machines. (4 marks)
- (c) State the four advantages of the electric drive. (4 marks)
- (d) State and explain the parts of a refrigeration system (8 marks)
- (e) Why braking is required? Explain each of the electrical braking briefly (6 marks)
- (f) Name *three* types of traction. (3 marks)

QUESTION TWO (20 MARKS)

- (a) Explain the following terms
 - i. Refrigeration effect.
 - ii. Tonofrefrigeration.
 - iii. Co-efficient of Performance (COP). (6 marks)

- (b) Write disadvantages of an electric drive system. (4 marks)
- (c) State and Explain *three* methods of starting an Induction motor (6 marks)
- (d) Name types of systems of traction. (4 marks)

QUESTION THREE (20 marks)

- a) With a neat sketch, explain the working of vapour absorption refrigeration system. (10 marks)
- b) Name the most commonly used refrigerants and state their uses. (10 marks)

QUESTION FOUR (20 MARKS)

- a) Mention the desirable properties of a good refrigerant and explain. (10 marks)
- b) The distance between two stations is 1.92kms. The scheduled speed and the duration of stops respectively are 40kmph and 20sec. assume the quadrilateral approximation of the speed-time curve and the coasting and braking retardation as 0.16kmphps and 3.2kmphps respectively. Determine the acceleration if the speed at the end of the accelerating period is 60.8kmph. Find also the duration of the coasting period. (10 marks)

QUESTION FIVE (20 MARKS)

With a neat sketch, explain the working of Vapour Compression Refrigeration system

(20 marks)